

Remarks

Claim Status

Claims 1-91 were originally presented for examination in this application. In a preliminary amendment filed on May 14, 2004, Applicants cancelled claims 41-91. A restriction requirement was issued on February 14, 2006, and Applicants elected claims 26-40 in response thereto. An Office Action was issued on April 7, 2006, rejecting claims 26-40. In response, Applicants submitted an Amendment and Response on July 5, 2006, in which claims 26 and 34-37 were amended and new claims 92-106 were added. A Final Office Action issued on October 23, 2006, rejecting all pending claims. In conjunction with a Request for Continued Examination, Applicants filed a response to the Final Office Action in which claims 26, 37, 98, 99 and 101 were amended to address the pending rejections and to further clarify and describe the invention with greater particularity. An Office Action was issued on May 10, 2007, in which:

- Claim 26 was rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant's regard as the invention. Applicants have amended claim 26 to address this rejection.
- Claims 26-39, 92-95, 97, 98 and 101-106 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2002/0087275 to Kim et al. ("Kim").
- Claims 40, 96, 99 and 100 were rejected under 35 U.S.C. §103(a) as being obvious in light of Kim in view of U.S. Patent Publication No. 2002/0198858 to Stanley et al. ("Stanley").

In this response, Applicants have amended claim 26 to address these rejections and to further clarify and describe the invention with greater particularity. Support for these amendments can be found at least at paragraphs [0067] – [0072] and [0173]. No new matter has been added.

Information Disclosure Statement

Applicants thank the Examiner for considering the references cited in previously submitted Information Disclosure Statements, and further submit a Ninth Supplemental Information Disclosure Statement herewith, and request that the references included be considered prior to any subsequent Office Actions.

Claim Rejections Under 35 U.S.C. 102(e)

Claim 26

Independent claim 26, as amended, includes a data storage module that stores a library of case frame templates and an inference engine for translating biological data into a form compatible with a database of life science data. Each stored case frame template includes a predefined collection of relationship connectors between unspecified objects with defined object types, wherein the connectors are based on a causal relationship between unspecified objects of the defined object type and on a life science ontology. When new information is added to the database, the inference engine selects an appropriate case frame template to use to represent the new data and creates a case frame from the template by assigning elements of the new data to previously unspecified object identifiers in the case frame. As a result, new life science assertions are created in the database that are consistent with the ontology. The cited art simply does not describe such a system.

Briefly, Kim describes a method for representing molecular biological relationships using graphical tools. Kim, para. [0035]. According to the Examiner, Kim describes using “three different templates for adding three different types of data to the database.” Office action, pag. 10, para. 9. Although Kim does discuss using “a label and an information table” to annotate vertices of the graphical information, Kim relies on a two-step method for creating data in the database. First, Kim details a series of steps for creating individual vertices that represent yeast genes. Kim, paras. [0080] - [0100]. Kim then describes a subsequent step of defining edges that require the definition of various components (including the vertices) as prerequisites. Kim, para. [0095]. In each case, users must provide a set of previously defined vertices in order to build

components of the graph. Such an approach ignores the inherent relationships that are captured in the case frame structure and claimed by Applicants.

The presented claims, as amended, go well beyond what is disclosed in Kim. By maintaining a library of pre-defined case frames that include both object type information and pre-defined connectors that are based on causal relationships between the object identifiers, an inference engine can select an appropriate case frame with which to add new data into the database that includes both the object identifiers and the relationships among the identifiers such that new life science assertions added to the database conform to a specified life science ontology. In doing so, Applicants' invention facilitates an automated and rapid expansion of the database in a manner that is beyond the manual means of first creating vertices and subsequently defining edges between vertices as described by Kim. As such, the case frames go well beyond simple data structures described in Kim and actually enforce the structure and biological relationships of a defined life science ontology. Using this data assertion process, the Assignee has, as of this date, built a database comprising millions of assertions, using only a handful of curators to do so.

Moreover, Stanley does not cure the discrepancies of Kim. Briefly, Stanley describes a software architecture that represents data records using "Intelligent Molecular Objects" (IMOs), which provide a means for querying heterogeneous data sets using a common interface. Stanley does not contemplate using pre-existing case frames and a life science ontology to govern the introduction of new data into biological knowledge base.

Thus, because neither Kim nor Stanley teaches or suggests every element of independent claim 26 as amended, Applicants respectfully submit that these references, alone or in combination, fail to anticipate these claims or render the claims as obvious. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 26 under 35 U.S.C. §102(e), as well as those claims that depend directly or indirectly therefrom.

Independent Claim 101

Independent claim 101 as amended recites, in part, an electronic database for storing a plurality of case frames representing enzyme reactions, binding interactions, modifications of polymers, protein phosphorylation reactions, gene expressions, acetylation, peptide-bond cleavage, glycosylation, lipidation, methylation, metallation, cross-linking, hydroxylation, sulfation ADP-ribosylation, translocation and transcriptional activations. Neither the database described in Kim, nor the software objects described by Stanley model all of these biological functions.

Thus, because neither Kim nor Stanley teaches or suggests every element of independent claim 101 as amended, Applicants respectfully submit that these references, alone or in combination, fail to anticipate these claims or render the claims as obvious. Accordingly, Applicants respectfully request that claim 101, as well as those claims that depend directly or indirectly therefrom, be allowed.

Conclusion

Applicants respectfully submit that, in light of the foregoing amendments and remarks, claims 26-40 and 92-106 are in condition for allowance, and requests that application proceed to issue. If, in the Examiner's opinion, a telephonic interview would expedite the favorable prosecution of the present application, the undersigned attorney would welcome the opportunity to discuss any outstanding issues and to work with the Examiner toward placing the application in condition for allowance.

Respectfully submitted,

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